

**Abstract**

The present invention provides a procaryotic host cell stably transformed or transfected by a vector including a DNA sequence encoding for mutant purine nucleoside phosphorylase or hydrolase. The transformed or transfected  
5 procaryotic host cell can be used in combination with a purine substrate to treat tumor cells and/or virally infected cells. The present invention provides nucleotide sequences encoding mutant *E. coli* derived purine nucleoside phosphorylase proteins which can be used in conjunction with an appropriate substrate to produce toxins which impair abnormal cell growth. The invention  
10 provides for delivery of the toxin by generation within target cells or by administration and delivery to the cells from without.